

User Manual



SPT - 20 ION – COATER



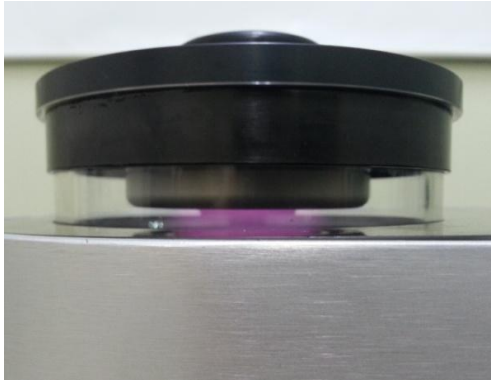
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1. Components



Ion Coater



Rotary Pump



Power Cable



User Manual

※ Other Targets than provided by default (Pu) should be purchased separately.

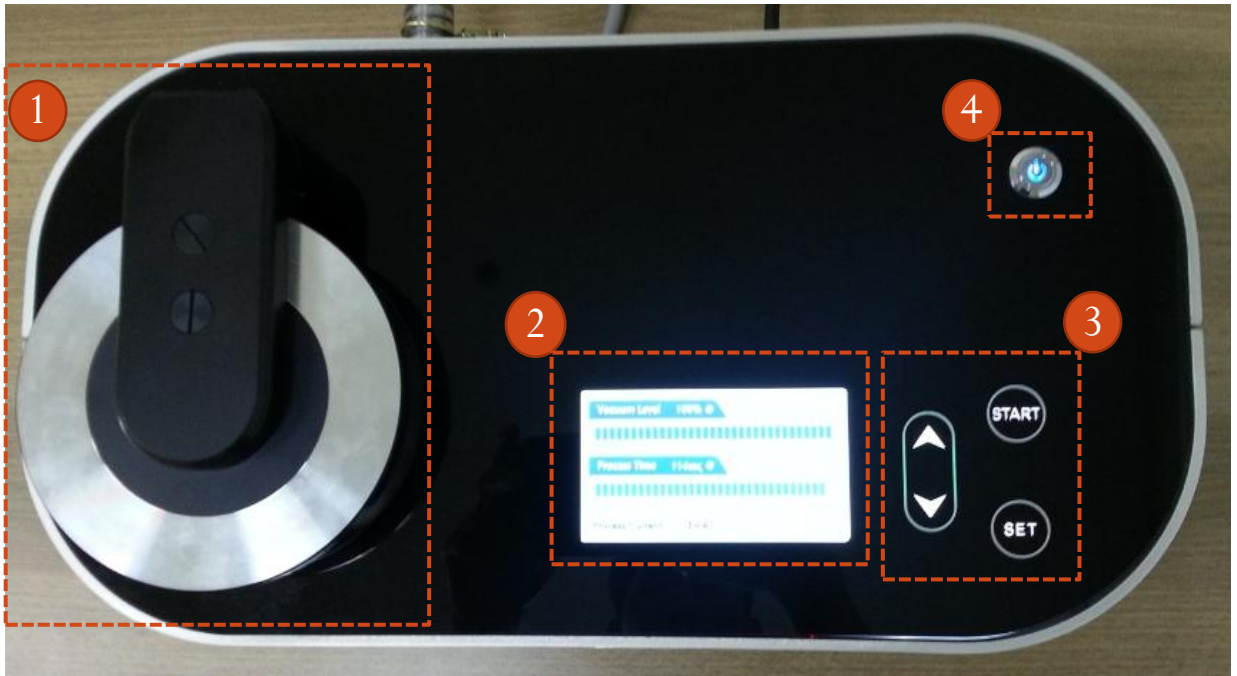
2. Names of Parts

2-1. Front Side



- 1) Vacuum Unit (Chamber, Target)
- 2) Main Body Case

2-2. Top Side



- 1) Vacuum Unit (Chamber and Target)
- 2) Display LCD
- 3) Touch Buttons
 - Start :
 - Start Coating with a beef : Press the button for 2~3seconds.
 - **Emergency Stop : Press the button for 3~5 seconds in Coating progress.**
 - Up & Down Arrow : Change Target, Current, Time values.
 - Set : Select items of Target, Current and Time.
- 4) Soft Push Power Button for Off/On LED display
 - OFF (Press the Push button for 2~3 sec in Setup mode, then turned off LED with a beef.)
 - ON (In the Off state, press the Push button.)

2-3. Back Side



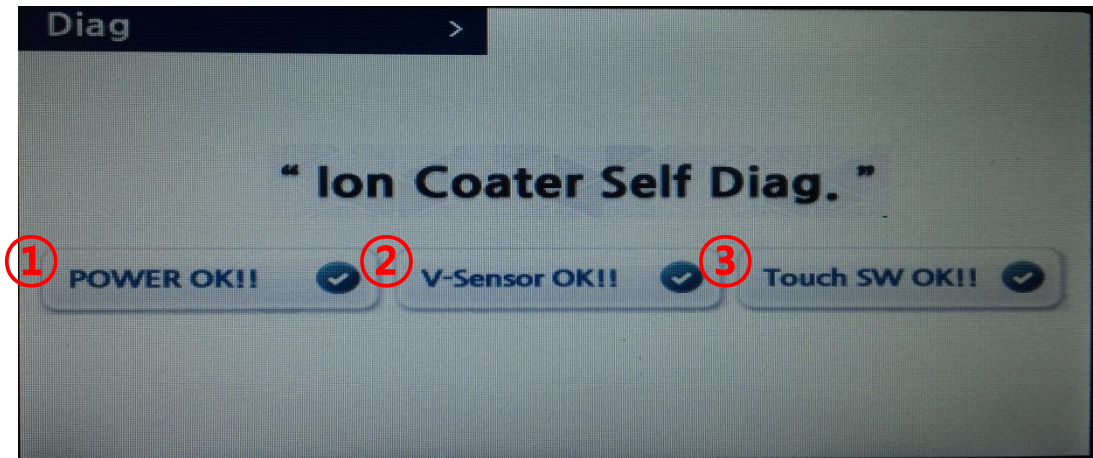
- 1) Main Power Cord and Switch.
- 2) Fuse Holder
- 3) Power Cord for Rotary Pump
- 4) Vacuum Valve Connector
 - Connect the Rotary Pump Hose and the Vacuum Valve using by NW16 Clamp.

※ **Request A/S when moving the installation;**

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3. How to Use Ion Coater

3-1. Self Diagnosis



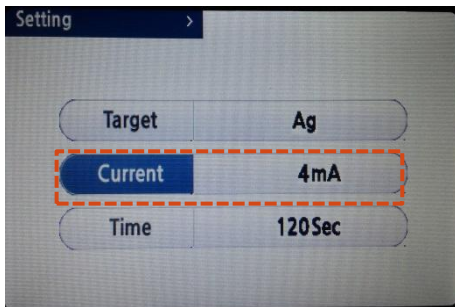
First, "ON" the Main Power Switch on the back side.

- 1) ① POWER OK! with Power Check Beep.
- 2) ② Vacuum Sensor OK! with Vacuum Check Beep.
- 3) ③ Touch Program OK! with Switch Check Beep.
- 4) Enter into Set Mode, at the end of the 3 steps Self Diagnosis above.

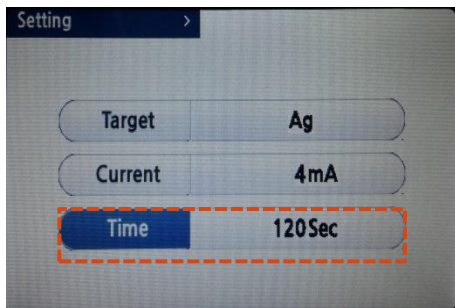
3-2. Using Buttons (shown in Section 2-2)



<Fig. 1>



<Fig. 2>



<Fig. 3>

- 1) Main power switch "ON"
- 2) Setting mode : If main power is On,
Enter into Setup mode on LCD.
- 3) Setting Target :
 - ① Set Target using by Up, Down buttons in Setup Mode.
- 4) Setting Current :
 - ① Select Current by pressing Set button in Setup Mode.
 - ② Set Coating Current Values by Up, Down buttons.
 - ③ Range : 1 ~ 9mA (1mA increments)
- 5) Setting Coating Time :
 - ① Select Time by pressing Set button in Setup Mode.
 - ② Set Coating Time Values by Up, Down buttons.
 - ③ Range : 10 ~ 500sec (10 second increments)
 - ④ Maximum Coating Time

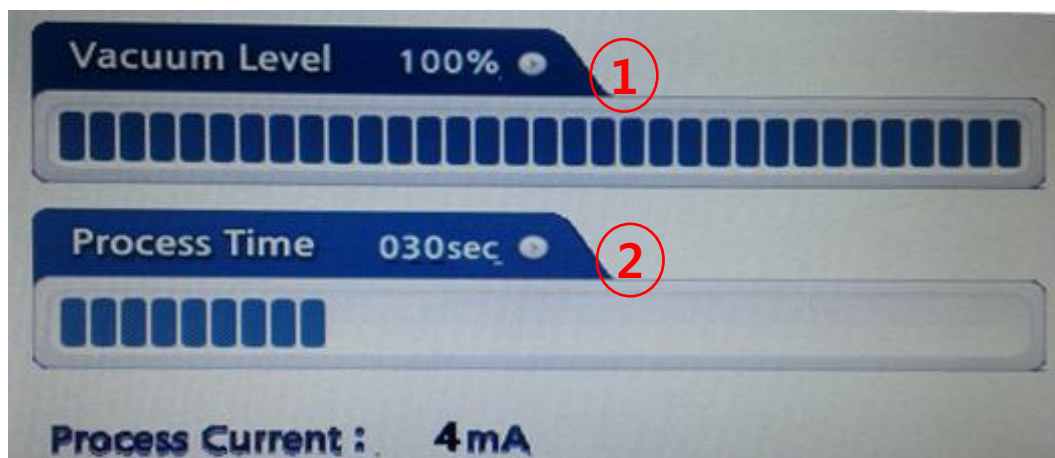
Current	Coating Time
0 mA	10 ~ 990 sec
1~2mA	10 ~ 500 sec
3mA	10 ~ 400sec
4~6mA	10 ~ 300 sec
7mA	10 ~ 240 sec
8mA	10 ~ 180 sec
9mA	10 ~ 120 sec

 **0mA selection is for vacuum dry(0.1~0.01torr)**

- 6) After setting Target, Current and Time, press Start button 2~3 sec,
then Coating is started with beep sound.
 - Emergency Stop : Press Start button 3~4sec during Coating, then
stopped with displaying "CANCEL".
- 7) In the main power "ON" state, you can off LED by pressing the
Soft Push Power button during Setup Mode.
 - OFF (Press the Push button for 2~3 sec in Setup mode, then
turned off LED with a beep.)
 - ON (Press the Push button in the Off state.)

3-3. Sequence of Coating

- 1) Press the Start button 2~3 seconds.



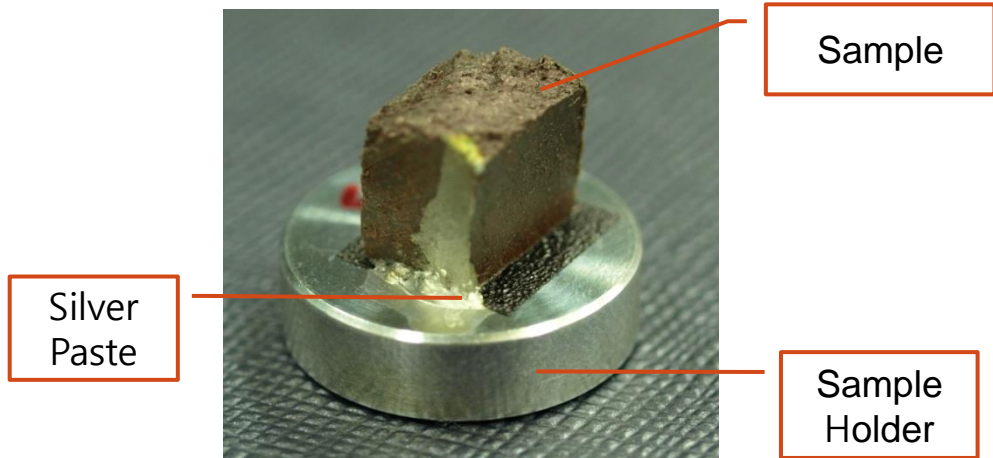
- 2) ① Start Coating after Vacuum Level 100% (1.0×10^{-1} Torr).
- 3) ② Complete Coating when Process time is same as Set time.

3-4. Setting Current & Time of Coating

- 1) Setting Value of Current & Time : 1 ~ 9mA, 10 ~ 500sec
(Refer to table below.)

Current	Time
Normal : 3mA	Normal : 120sec
If sample particles are less(powder) or curvature, increase Current.	If sample particles are less(powder) or curvature, increase Time.
If sample particles are large or plane, decrease Current.	If sample particles are large or plane, decrease Time.
※ If there are severe curvatures in cross-section of Sample to observe, it should be coated with the tilted Sample support.	

2) Coating of Curvature Sample



In case of severe curvature or large size of samples (non-conductive), in order to prevent the sample's Charge-up phenomenon, it should be coated the wall of samples and the sample support with a silver paste, or coated the side of sample with a tilted support.

3-5. Time to reach Vacuum 1.0×10^{-1} Torr:

- 1) within 3 minutes.

3-6. Check Errors

- 1) "V-Sensor Error": Generated Vacuum Fault. → Request A/S.
- 2) "Touch SW Error": Generated touch program error. → Request A/S.

※ Request A/S : #201 Migun-Techno-World, 533 Yongsan-Dong,
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3-7. Complete Coating



A screenshot of a device screen displaying a completion message and a table of coating parameters. At the top, a blue banner with white text reads "Complete!!!". Below this, a table with four rows and two columns is shown. The first column contains numbered red circles (1, 2, 3, 4) next to parameter names. The second column contains the corresponding values. The parameters are Target (Ag), Thickness (123nm), Time (005 sec), and Current (4mA).

① Target	Ag
② Thickness	123nm
③ Time	005 sec
④ Current	4mA

- 1) ① Confirm Target set in Setup Mode.
 - 2) ② Thickness Coated
 - 3) ③ Coating Time
(An indicated thickness is an tested & calculated data, then the actual values can vary according to conditions.)
 - 4) ④ Setting Current Value
 - 5) After completion of Coating, press any button to re-enter into Setup Mode.
- ※ After using Coating 50th, when "Clean Message" is displayed, separate the Chamber and verify Chamber status, and re-use after Cleaning. (Refer to Chapter 5.)

4. Replacing Target



1



2



3



4

- Replacement Procedure : 1, 2, 3, 4

- 1) Wearing vinyl gloves, then separate the insulation support of the electrode.
- 2) After tilting the upper surface flange 45°, Remove the nut of the high voltage electrode plate. Tilt 45° also when you re-assemble.
- 3) When you assemble Target, it should be confirmed the Target is fully contacted with nuts.
- 4) Target dimensions : 50.8Φ / 0.1t

5. Cleaning Vacuum Unit (Chamber)



1



2



3



4



5



6

- Replacement Procedure : 1, 2, 3, 4, 5, 6, 7

- 1) Should prepare cleaning air (dust removal), alcohol and wiper occurs less lint and dirt for precision equipment.
- 2) To apply an appropriate amount of alcohol to the wiper.
- 3) To clean the inside of contaminated Chamber.
- 4) To clean Rubber Pad after separation from Chamber.
- 5) To clean the Up/Down flange surface of Chamber.
- 6) Blow out dust all on the surface and flange which has been cleaned.
- 7) After applying grease to Rubber Pad inside, it should be combined with Chamber glass to re-use.

6-1. CAUTION

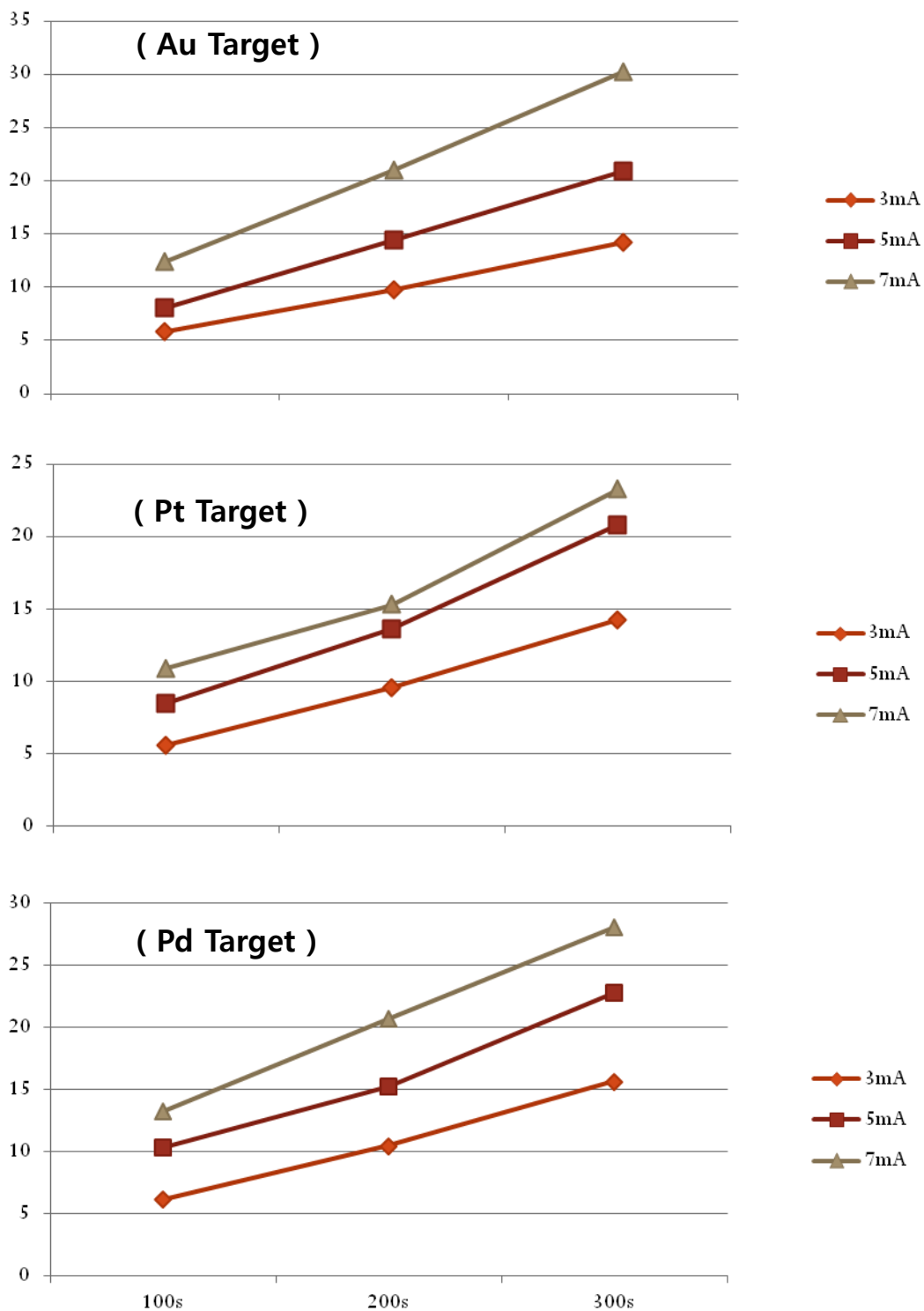
1. Should be careful on the bending of the vacuum hose at the time of installation and use. (May take a long time to vacuum.)
2. Before installing, make sure the ground wire is connected to the consent outlet.
3. By rotating the sample stand depending on the height of the sample, the distance between the target and the height of sample should be maintained at 2~3cm.
4. If the pump does not work, make sure the power switch of the pump.
5. Periodically, the target and vacuum devices should be cleaned of dust.
6. Vacuum can take a long time in case of re-use, right after awaiting in the air for more than two days without using Coater.

6-2. WARNING

1. If necessary the emergency stop during the real Coating progress, Do not turn off the Main Power switch, but press the Start button for 3~5 seconds to stop safely working of Coater.
2. Do not disassemble or re-assemble on your own needs. There is a risk of electric shock. When you have a problem, please contact us at the following;

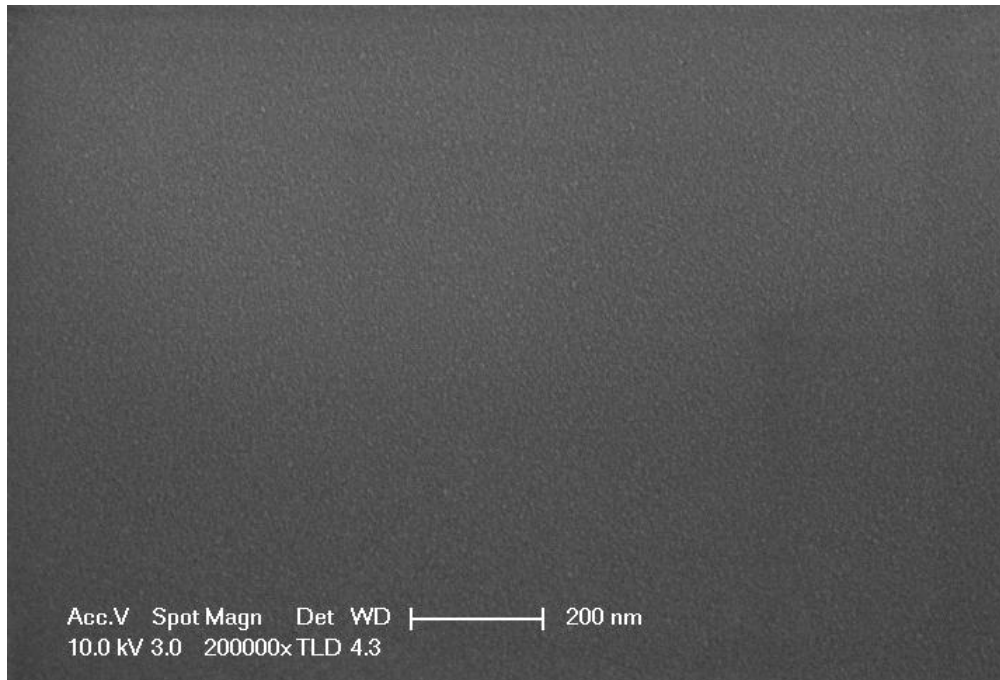
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7. Thickness Rate Graph

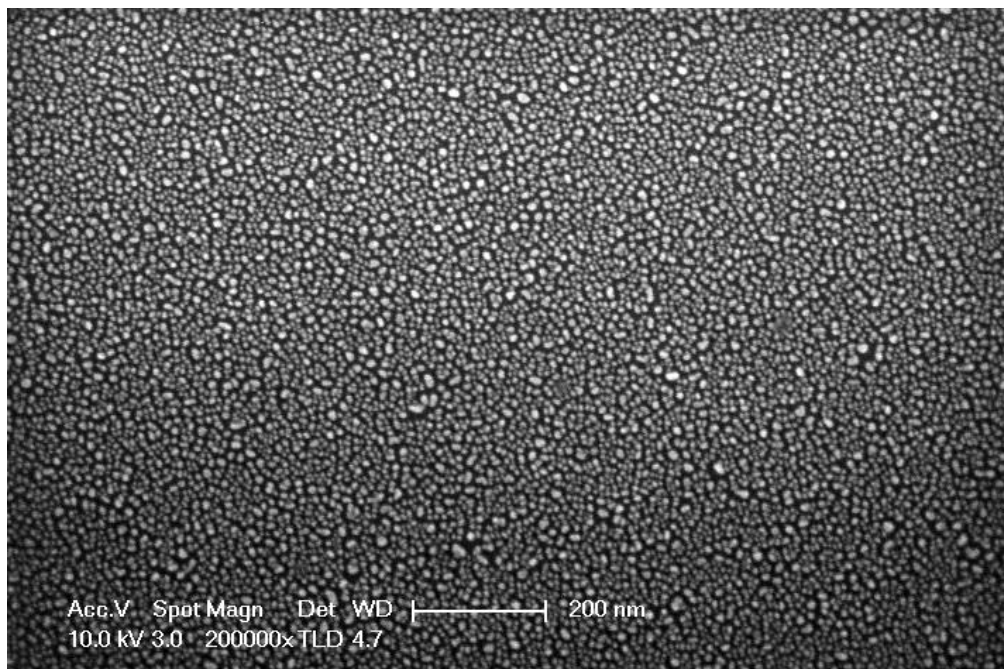


8. Photos Measured by FE-SEM

PT Grain (x200,000)

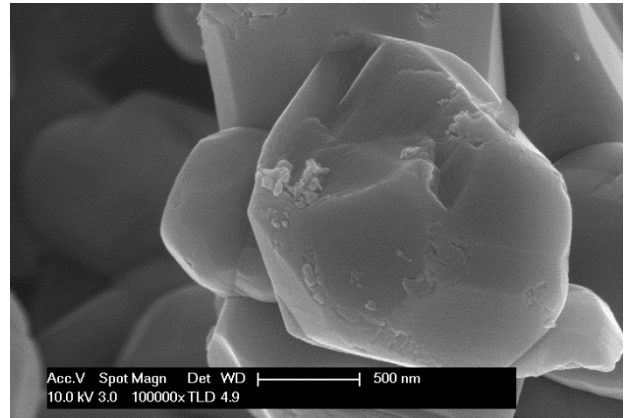
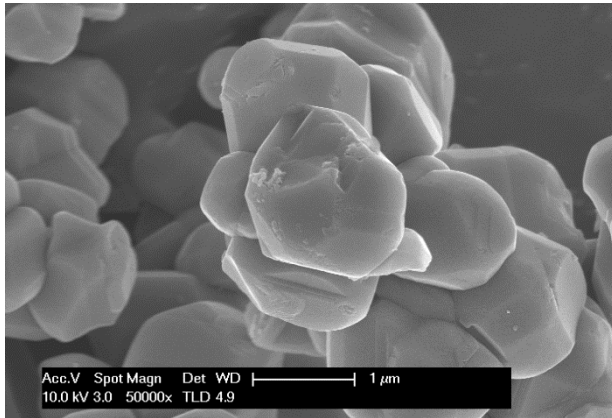


Au Grain (x200,000)

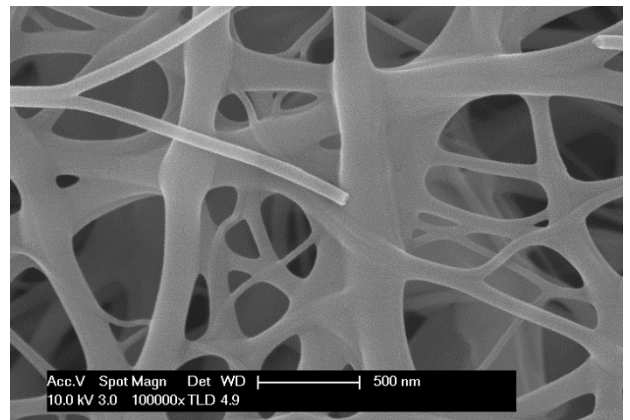
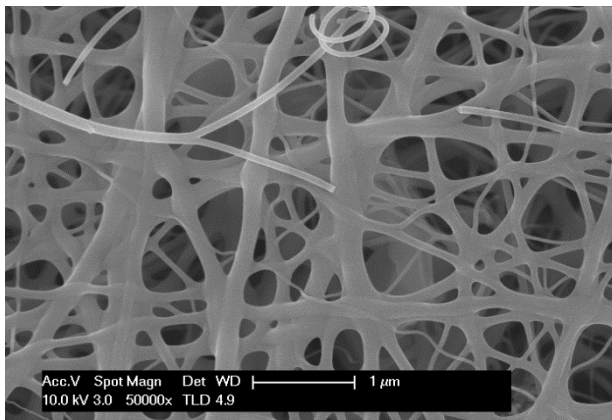


9. Sample Photos Measured (FE-SEM)

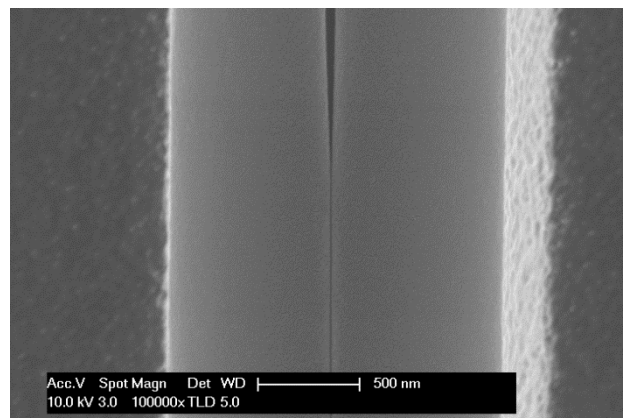
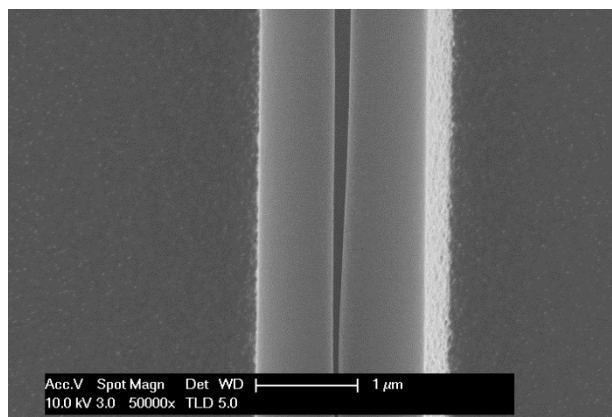
Carbon Powder (x50K, x100K)



Fiber (x50K, x100K)



Si Wafer (x50K, x100K)



10. Specifications of SPT-20

Specifications of SPT-20	
Power Consumption	AC 220V, 500W
Weight	10 Kg
Dimension	420 mm (W) x 220 mm (D) x 230 mm (H)
Rotary Pump	50 L/min(60Hz), AC 220V, 150 W, 14.5Kg
Diameter of Target	50.8 mm
Operating Vacuum	About 0.1 Torr
Maximum Ion Voltage	~ 3 KV
Ion Current	1 ~ 9 mA
Coating Time	10 ~ 500 sec (10 sec/step)

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